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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,023	01/23/2004	Jae Yeong Park	2080-3-218	7950

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EXAMINER

SAINT SURIN, JACQUES M

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/764,023

Applicant(s)

PARK ET AL.

Examiner

Jacques M. Saint-Surin

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-12, 14-18 and 21-23 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 13, 19, 20 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. This Office Action is responsive to the amendment of 12/22/05.

***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1-3, 6-9, 11, 14-15 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Drees et al. (US Patent 5,932,953).

Regarding claim 1, Dress discloses a material sensing sensor using a thin film bulk acoustic resonator (TFBAR) (a bulk-acoustic wave piezoelectric resonator 20 is used as a sensor to detect the existence of a given material, see: col. 4, lines 15-17, Figs 1A-1B, and 5A-5B) comprising:

a first thin film bulk acoustic resonator (sensing resonator 50, see: col. 7, line 3, Figs. 5A-5B also shows resonator 72) for generating a first resonant frequency according to the amount and/or thickness of a target material (see also col. 7, lines 50-59); wherein the first thin film bulk acoustic resonator further comprises a reactive layer (SiO<sub>2</sub> layer 76) and

a reference thin film bulk acoustic resonator (reference resonator 52, see: col. 7, line 4 and Figs 5A-5b shows resonator 74 as reference resonator) for generating a reference resonant frequency.

Art Unit: 2856

Regarding claims 2-3, Drees shows a first channel pattern formed on the first resonator 72 and receiving the target material and a second channel pattern formed on the reference resonator 74, see: Figs. 5a and 5b.

Regarding claims 6-7 and 21-22, Fig 5b shows substantially the claimed

invention as follows: substrate (78);

a membrane support layer formed on the substrate (80);

a common lower electrode formed on the membrane layer (area above item 80 of Fig. 5b);

a piezoelectric material layer formed on the lower electrode (layer 76);

first and second upper electrodes (88 and 92) formed on the piezoelectric material layer (col. 7, line 63), wherein the reactive layer is formed on the first upper electrode (88);

a chamber structure formed to expose the reactive layer ( $\text{SiO}_2$  is a reactive layer) and a portion of the second upper electrode (92, see:Fig. 5B).

Regarding claims 8-9, Drees discloses for instance, two or more three-port TFR devices each having a sensing resonator and a reference resonator can be monolithically fabricated on one substrate (col. 8, lines 59-61). Drees further discloses the general structure of the monolithic sensing/reference resonator combination described above can be used to fabricate sensing devices with more than two resonators on a given substrate 9col. 8, lines 55-59.

Regarding claims 11 and 14-15, as discussed above, they are rejected for the reasons set forth for claims 12 and 23. Furthermore, Drees discloses a signal processor (phase detector 36) that includes a double mixer 44.

***Claim Rejections - 35 USC § 103***

4. Claims 10 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable Over Drees et al. (US Patent 5,932,953) in view of Ueyanagi et al. (US Pub 2002/0017138 A1).

Regarding claims 10 and 16-18, Drees does not disclose a sensor chip package Having bonding pads connected to the sensor chip, external connection pins connected to the bonding pads and a structure for protecting and supporting the sensor chip. Ueyanagi discloses the semiconductor sensor package is a package for incorporating a semiconductor sensor chip characterized in that a main surface for mounting the semiconductor chip is formed at a predetermined angle with respect to the surface of a printed circuit board mounting the package, the main surface is provided with a plurality of terminals along two opposite sides thereof for connecting with input/output terminals of the semiconductor sensor chip, a bottom surface perpendicular to the main surface is provided with a plurality of pins respectively formed along the two sides parallel to the main surface, which plurality of pins are inserted into mounting holes formed on the printed circuit board, and the plurality of terminals and the plurality of pins are electrically connected along two side surfaces sandwiching the main surface, see: page 5, paragraph 0085. It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Drees the techniques of Ueyanagi

Art Unit: 2856

because since mounting of the sensor chip package is possible by inserting pins into the printed circuit board, direction of the physical value to be detected and direction of the sensor chip can be positively positioned in a single direction, thereby improving reliability of the detection signal.

5. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drees et al. (US Patent 5,932,953) in view of Wohltjen (US Patent 4,312,228).

Regarding claims 12 and 23, Drees discloses the sensing oscillator the reference oscillator, a mixer 44 and a power measuring unit, signal mixer, however, it does not disclose a radio frequency mixer. Wohltjen discloses the outputs of the surface acoustic wave are fed to a double balanced mixer having radio frequency, see: col. 8, lines 23-26. It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute the mixer of Drees for that of Wohltjen because it would produce a measurable voltage change in the mixer signal in a reliable manner.

#### ***Allowable Subject Matter***

6. Claims 4-5, 13, 19-20 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

7. Applicant's arguments filed 12/22/05 have been fully considered but they are not persuasive. In response to Applicant's arguments that Drees does not teach or suggest a reactive layer, the Examiner, respectfully, disagrees with Applicant's argument because Drees teaches SiO<sub>2</sub> which is a reactive layer.

Art Unit: 2856

8. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a reactive layer deposited within the sensing resonator cavity and not within the reference resonator cavity) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### **Conclusion**

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M. Saint-Surin whose telephone number is

Art Unit: 2856

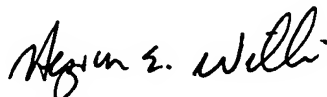
(571) 272-2206. The examiner can normally be reached on Mondays through Fridays  
10:30 A.M. -7:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272 2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JMS  
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March 03, 2006



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